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Brief report

Social anxiety in adult autism spectrum disorder

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ABSTRACT

A link has been suggested between Autism Spectrum Disorder (ASD) and anxiety disorders. The aim of the study was to examine the severity of social anxiety measured by the Liebowitz Social Anxiety Scale Self-Report and prevalence of Social Anxiety Disorder (SAD) in adults with ASD, with SAD and a non-ASD comparison group. Individuals with ASD showed significantly higher scores of social anxiety and social avoidance relative to the comparison group, but significantly lower scores relative to the SAD sample.

1. Introduction

Individuals with autism spectrum disorder (ASD) show high rates of psychiatric comorbidity (for a review see Mazzone et al., 2012). Children and adolescents with ASD appear to be especially prone to develop social anxiety (Bellini, 2004; Kuusikko et al., 2008). Contributing factors to social anxiety could be sensory oversensitivity, difficulties in perspective taking and limited capacity in socializing with others (American Psychiatric Association, 2013). Most children with ASD have also experienced repeated rejection (Cappadocia et al., 2012; Bejerot and Humble, 2013), which may result in social anxiety and avoidance.

Social withdrawal and being quiet in social situations characterize social anxiety disorder (SAD) and these behaviors are also commonly observed in ASD (Eriksson et al., 2013). These may initially confuse the picture of ASD, resulting in too frequent SAD diagnoses and delays in establishing ASD. For example, Rydén and Bejerot (2008) found that 17% of an adult psychiatric outpatient sample had been diagnosed with SAD prior to establishing ASD. However, a recent study (Lugnegård et al., 2011) has suggested an occurrence of SAD in 22%, of a previously identified adult ASD sample.

Hitherto, studies have focused on social anxiety in children and adolescents with ASD, whereas the occurrence of SAD among adults has been sparsely studied. In this study, we similar to Lugnegård et al. (2011) examined the occurrence of SAD in an adult ASD sample. In addition, we examined the severity of social anxiety and avoidance in comparison to adults with SAD and a non-ASD comparison group.

2. Methods

2.1. Participants

Fifty adults with ASD, 53 subjects in a non-ASD comparison group and 100 individuals with SAD participated in the study. Participants with ASD and the non-ASD comparison group were derived from a study by Bejerot et al. (2012), and participants with SAD from a randomized treatment study by Mörtberg et al. (2007).

Participants with a diagnosis of ASD were recruited through an outpatient tertiary psychiatric unit for diagnosing ASD, a community-based facility for adult ASD, and in six cases, through a Swedish ASD web-site. Prior to the current study, a tertiary outpatient psychiatric team specialised in diagnosing ASD, and located in Stockholm, Sweden had carefully examined these participants. The team included a senior psychiatrist and an experienced psychologist in addition to other staff members. The assessments took at least 18 h to complete over a period of 2–3 weeks. A parental interview supporting ASD in the offspring was a requirement for a diagnosis of autism, Asperger disorder or atypical autism.

Participants were included if they were between 20 and 47 years. Exclusion criteria were any neurological or genetic syndrome, psychosis, any disease or medication affecting androgen status, any congenital syndrome, diagnosed malformations, intellectual disability or having attended education for children with intellectual disability in primary or secondary school. Twenty-seven participants were taking psychotropic medication (antidepressants ($N=20$), anxiolytics ($N=5$), hypnotics ($N=5$), stimulants ($N=3$), antipsychotics ($N=3$), mood-stabilizers ($N=2$) and antihistamine ($N=2$).

Participants in the non-ASD comparison group was a convenience sample recruited in order to match the ASD sample in age and gender. The Mini International Neuropsychiatric Interview (M.I.N.I.) (Allgulander et al., 2006; Lecrubier et al., 1997) was used to assess psychiatric disorders. One subject fulfilled the diagnostic criteria for SAD. Other current psychiatric disorders were major depression ($n=1$), panic disorder ($n=2$), alcohol dependency ($n=6$) and antisocial personality disorder ($n=1$). One subject was medicated with psychotropic medication, due to recurrent depressions.

The inclusion and exclusion criteria were identical to those reported above. Additional exclusion criteria were self-reported ASD and ASD in a first-degree family member. One individual was using an antidepressant.

Participants with SAD were recruited through advertisements in local newspapers. Inclusion criteria of the original trial were a primary diagnosis of social phobia according to DSM-IV and age between 18 and 65 years, no current psychiatric disorder

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(i.e. depressive episode, bipolar disorder, acute stress disorder, addiction, or psychoses), no current psychotropic medication or psychotherapy and absence of autistic traits (assessed by the High-Functioning Autism/Asperger Syndrome Global Scale, Bejerot et al., 2001).

2.2. Procedures

The ASD diagnosis was established by clinical interview, supported by the Autism Diagnostic Observation Schedule (Lord et al., 2000), and review of previous patient records and rating scales. Co-existing psychiatric disorders were assessed with the M.I.N.I. (Allgulander et al., 2006; Lecrubier et al., 1997).

The SAD diagnosis was established by diagnostic interview using the Structured Clinical Interview for DSM-IV (SCID) (First et al., 2002). A satisfactory interrater reliability (κ=0.76) for the interviewers' SAD diagnoses has previously been reported (Mörtberg et al., 2007).

2.3. Measures

Liebowitz Social Anxiety Scale Self-Report (LSAS-SR) is a scale for evaluating a wide range of social situations that are described as difficult for individuals with social anxiety. The scale contains 24 items, 13 concerning performance anxiety and 11 concerning social interaction anxiety. Each item is rated separately for fear (0–3=none, mild, moderate, severe) and avoidance behavior (0–3=never, occasionally, often, usually). The LSAS-SR has demonstrated good psychometric properties as indicated by the results of test-retest reliability, internal consistency (with Cronbach's α varying from 0.83 to 0.95 (Mattick and Clarke, 1998; Fresco et al., 2001)) and convergent and discriminant validity and compares well to the clinician-administered version (Liebowitz, 1985; Fresco et al., 2001; Baker et al., 2002). The average LSAS-SR score of a healthy population is 13.5 (S.D.: 12.7) and in SAD 73.4 (S.D.: 23.2) (Fresco et al., 2001).

High-Functioning Autism/Asperger Syndrome Global Scale (HAGS) is a clinician-rated measure of autistic traits in adults of normal intelligence (Bejerot et al., 2001). Autistic traits are determined by assessing appearance, behavior and functional impairment. Observations of social and emotional reciprocity, social competence, interest, rigidity, values, self-reflection, speech and language, body posture, gestures, facial expression and eye-to-eye contact are integrated into a four-level Likert scale (1=an exceptionally empathic and socially competent personality, 2=more or less normal, 'like most people', 3=an emotional bluntness and pathological personality with autistic traits, clearly noticeable during the interview, 4=an extremely odd personality, the person gives a peculiar and clearly autistic impression early in the interview). Ratings of 1 and 2 are signs of normal functioning, and 3 and 4 of autistic traits. The HAGS has satisfactory interrater reliability (κ=0.67).

The Autism Spectrum Quotient (AQ) is a 50 item self-evaluation questionnaire, assessing personal preferences and habits (Baron-Cohen et al., 2001). Subjects rate to what extent they agree or disagree with the statements on a 4-point Likert scale, with answer categories "definitely agree"; "slightly agree"; "slightly disagree" and "definitely disagree". AQ has satisfactory internal consistency with Cronbach's α varying from 0.63 to 0.78 (Baron-Cohen et al., 2001; Kurita et al., 2005).

3. Results

The gender distribution did not differ between groups. One-way Analysis of Variance (ANOVA) showed a significant difference in LSAS-SR scores between ASD, SAD and subjects in the non-ASD comparison group (LSAS-SR Anxiety: $F(2, 202)=104.1$ $P<0.001$; LSAS-SR Avoidance: $F(2, 202)=96.9$ $P<0.001$). Posthoc Bonferroni analyses showed higher scores of anxiety and avoidance in SAD relative to both ASD and subjects in the non-ASD comparison group ($P<0.001$), and higher scores of anxiety and avoidance in ASD relative to subjects in the non-ASD comparison group ($P<0.001$) Table 1.

Twenty-eight percent (14 of 50) of individuals with ASD fulfilled the diagnostic criteria for SAD according to the M.I.N.I. Their mean LSAS-SR score was 77. 9 (S.D.: 24.6), indicating that severity of social anxiety in this subgroup of ASD was similar to the clinical SAD group. Within the ASD group, the 14 individuals that fulfilled the criteria for social anxiety had a higher AQ score, 34.6 (S.D.: 7.5), than the rest of the group 28.1 (S.D.: 8.7), t (d.f.)=2.4(48), P=0.02.

Moreover, AQ scores were strongly correlated with LSAS-SR scores among the ASD participants (LSAS-SR Anxiety: r=0.67, $P<0.001$ and LSAS-SR Avoidance: r=0.56, $P<0.001$) as well as in the subjects in the non-ASD comparison group (LSAS-SR Anxiety: r=0.55, $P<0.001$ and LSAS-SR Avoidance r=0.50, $P<0.001$). No relationship was found between age and LSAS-SR scores in any of the groups.

4. Discussion

In this study we have shown high rates of social anxiety among adults with ASD and normal intelligence. Although the overall ratings of social anxiety and social avoidance were lower than those reported by people with SAD, they were substantially higher than those of the non-ASD comparison group. The occurrence of SAD within this ASD sample was only slightly higher than the 22% reported by Lugnegård et al. (2011) based on the SCID interview.

Nevertheless, there may be differences in the quality of social anxiety in ASD and SAD. According to Eriksson et al. (2013), two items in the social anxiety domain of the RAADS-14 Screen (the 14 item screen version of the Ritvo Autism and Asperger Diagnostic Scale-Revised) were found to successfully discriminate ASD from SAD. These two items *"It is very difficult for me to work and function in groups"* and *"How to make friends and socialize is a mystery to me"*, were scored higher by individuals with ASD than by individuals with SAD, suggesting different experiences in the groups. These items are closely related to the social interaction difficulties of people with ASD, and may not reflect anxiety at all.

An important difference between SAD and ASD is the presence of social awkwardness. Individuals with SAD sense that they are socially incompetent, although they have appropriate social skills, whereas the ASD group is socially awkward, regardless whether they have insight into their poor social skills or not. Hence, individuals with ASD and poor insight may be protected from developing social anxiety, however insight was not explicitly measured in our study. Nevertheless, general endorsement of ASD symptoms should reflect insight in an ASD population. In this study greater endorsement of autistic symptoms measured with the AQ, was associated with more severe social anxiety measured with the LSAS-SR. In a study on adolescents with ASD low levels of empathy and low social anxiety were associated, and as empathy scores increased so did social anxiety, up to a certain level (Bellini, 2004). The author proposed that either unawareness of, or perhaps being unconcerned with how people perceive them, could be protective factors for social anxiety. A recent study on social cognition and anxiety in children did however

Table 1
Demographic characteristics and social anxiety symptoms in subjects with ASD, with SAD and in the non-ASD comparison group.

	ASD (n: 50)	SAD (n: 100)	Non-ASD comparison group (n: 53)
Age, mean (S.D.), range	30.0 (7.3), 27.9–32.1	34.6 (9.1) 32.8–36.4	32.3 (10.8), 28.4–32.5
Higher education[a] (n/%)	24 (48)	43 (43)	45 (85)
Cohabitant, (n/%)	9 (18)	49 (49)	26 (49)
Males/females, %	52/48	37/63	52.8/47.2
LSAS-SR Anxiety, mean (S.D.)	30.7(15.9)	40.7 (12.0)	10.7 (7.9)
LSAS –SR Avoidance, mean (S.D.)	25.9 (13.5)	35.7 (11.5)	9.2 (7.8)

Note: LSAS-SR=Liebowitz Social Anxiety Scale, self-report.

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fail to show a relationship, but social anxiety was not specifically targeted in that study (Hollocks et al., 2014).

A clinical observation, though not measured by the LSAS-SR, is the high prevalence of physiological signs in SAD (such as blushing, sweating and tremor) (Bögels et al., 2010), which are rarely observed in ASD. In addition, small talk in a one-to-one setting with a person with SAD generally proceeds smoothly, in contrast to small talk with a person with ASD.

In comparison with healthy controls, behavioral avoidance and social anxiety is shown to increase by age among children and adolescents with ASD, whereas behavioral avoidance is shown to decrease by age among controls (Kuusikko et al., 2008). The present study indicates that social avoidance and social anxiety will continue into adulthood, and age will not influence the level of social anxiety in adult ASD. Individuals with ASD are likely to suffer from social anxiety, which to a large extent may contribute to the social avoidance typically seen in this population.

Limitations of the present study are the small sample sizes, and assessments at different time points. However, as ASD and SAD are chronic disorders, different time points should not affect the results. The strengths of this study are the careful diagnostic procedures with structured interviews and rating scales with sound psychometric properties.

Future studies should focus on similarities and discrepancies in the quality of social anxiety and avoidance in ASD and SAD, and further determine the causes of social avoidance in ASD.

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References

Allgulander, C., Waern, M., Humble, M., Andersch, S., Ågren, H., 2006. The Mini International Neuropsychiatric Interview (M.I.N.I.). Swedish revised version 5.0.0.. Karolinska Institutet, The Sahlgrenska Academy, Stockholm.

American Psychiatric Association, 2013. Diagnostic and Statistical Manual of Mental Disorders, 5th ed. American Psychiatric Association, Washington, DC.

Baker, S.L., Heinrichs, N., Kim, H.J., Hofmann, S.G., 2002. The Liebowitz Social Anxiety Scale as a self-report instrument: a preliminary psychometric analysis. Behaviour Research and Therapy 40, 701–715.

Baron-Cohen, S., Wheelwright, S., Skinner, R., Martin, J., Clubley, E., 2001. The Autism-Spectrum Quotient (AQ): evidence from Asperger syndrome/high-functioning autism, males and females, scientists and mathematicians. Journal of Autism and Developmental Disorders 31, 5–17.

Bejerot, S., Nylander, L., Lindström, E., 2001. Autistic traits in obsessive compulsive disorder. Nordic Journal of Psychiatry 55, 169–176.

Bejerot, S., Eriksson, J.M., Bonde, S., Carlström, K., Humble, M.B., Eriksson, E., 2012. The extreme male brain revisited: gender coherence in adults with Autism Spectrum Disorder. British Journal of Psychiatry 201, 116–123.

Bejerot, S., Humble, M.B., 2013. Childhood clumsiness and peer victimization: a case-control study of psychiatric patients. BMC Psychiatry 13, 68.

Bellini, S., 2004. Social skill deficits and anxiety in high-functioning adolescents with autism spectrum disorders. Focus on Autism and Other Developmental Disabilities 19, 78–86.

Bögels, S.M., Alden, L., Beidel, D.C., Clark, L.A., Pine, D.S., Stein, M.B., Voncken, M., 2010. Social anxiety disorder: questions and answers for the DSM-5. Depression and Anxiety 27, 168–189.

Cappadocia, M.C., Weiss, J.A., Pepler, D., 2012. Bullying experiences among children and youth with autism spectrum disorders. Journal of Autism and Developmental Disorders 42, 266–277.

Eriksson, J.M., Andersen, L.M., Bejerot, S., 2013. RAADS-14 Screen: validity of a screening tool for Autism Spectrum Disorder in an adult psychiatric population. Molecular Autism 4, 49.

First, M.B., Spitzer, R.L., Gibbon, M., Williams, J.B.W. (Eds.), 2002. Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition. Biometrics Research, New York State Psychiatric Institute, New York.

Fresco, D.M., Coles, M.E., Heimberg, R.G., Liebowitz, M.R., Hami, S., Stein, M.B., Goetz, D., 2001. The Liebowitz Social Anxiety Scale: a comparison of the psychometric properties of self-report and clinician-administered formats. Psychological Medicine 31, 1025–1035.

Hollocks, M.J., Jones, C.R., Pickles, A., Baird, G., Happé, F., Charman, T., Simonoff, E., 2014. The association between social cognition and executive functioning and symptoms of anxiety and depression in adolescents with autism spectrum disorders. Autism Research 7, 216–228.

Kurita, H., Koyama, T., Osada, H., 2005. Autism-Spectrum Quotient-Japanese version and its short forms for screening normally intelligent persons with pervasive developmental disorders. Psychiatry and Clinical Neuroscience 59, 490–496.

Kuusikko, S., Pollock-Wurman, R., Jussila, K., Carter, A.S., Mattila, M., Ebieling, H., Pauls, D.L., Moilanen, I., 2008. Social anxiety in high-functioning children and adolescents with autism and asperger syndrome. Journal of Autism and Developmental Disorders 38, 1697–1709.

Lecrubier, Y., Sheehan, D.V., Weiller, E., Amorim, P., Bonora, I., Harnett Sheehan, K., Janavs, J., Dunbar, G.C., 1997. The Mini International Neuropsychiatric Interview MINI. A short diagnostic structured interview: reliability and validity according to the CIDI. European Psychiatry 12, 224–231.

Liebowitz, R., 1985. Social phobia. Modern Problems of Pharmacopsychiatry 22, 141–173.

Lord, C., Risi, S., Lambrecht, L., Cook Jr, E.H., Leventhal, B.L., DiLavore, P.C., Pickles, A., Rutter, M., 2000. The autism diagnostic observations schedule-generic: a standard measure of social and communication deficits associated with the spectrum of autism. Journal of Autism and Developmental Disorders 30, 205–223.

Lugnegård, T., Hallerbäck, M.U., Gillberg, C., 2011. Psychiatric comorbidity in young adults with a clinical diagnosis of Asperger syndrome. Research in Developmental Disabilities 32, 1910–1917.

Mattick, R.P., Clarke, J.C., 1998. Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. Behaviour Research and Therapy 36, 455–470.

Mazzone, L., Ruta, L., Reale, L., 2012. Psychiatric comorbidities in asperger syndrome and high functioning autism: diagnostic challenges. Annals of General Psychiatry 25, 11–16.

Mörtberg, E., Clark, D.M., Sundin, Ö., Åberg Wistedt, A., 2007. Intensive group cognitive treatment and individual cognitive therapy versus treatment as usual in social phobia: a randomized controlled trial. Acta Psychiatrica Scandinavica 115, 142–154.

Rydén, E., Bejerot, S., 2008. Autism spectrum disorder in an adult psychiatric population. A naturalistic cross sectional controlled study. Clinical Neuropsychiatry 5, 13–21.